

CLAIMS

The listing of the claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) An apparatus for wireless duplex communication, comprising, a first optical transceiver having a first optical transmitter and a first optical receiver, a second optical transceiver having a first optical transmitter and a first optical receiver, the first and second optical transceivers being located at opposite ends of an optical communication line formed thereby, wherein the output of each of the optical transmitters is a diverging beam of incoherent electromagnetic radiation arranged to have a cross sectional diameter which is larger than the cross sectional diameter of the respective optical receiver at that point on the communication line at which the respective optical receiver is situated, wherein each of the optical receivers includes an optical condenser lens having a focal plane, a photodiode, and a diaphragm having an aperture and situated in the focal plane of the optical condenser lens between the optical condenser lens and the photodiode, wherein the distance Δ between the diaphragm and the photodiode is defined by $\Delta = bF/D_c$, where b is the diameter of a light-sensitive site of the photodiode, D_c is the diameter of the optical condenser lens, and F is a focal distance of the optical condenser lens, and wherein a beam angle θ characterizing the first transmitters and the first receivers is defined by $\tan 2\theta = a/F$, where a is the aperture of the diaphragm.
2. (Previously Presented) An apparatus as claimed in Claim 1 wherein the optical transmitter emits electromagnetic radiation having a range of wavelengths.
3. (Previously Presented) An apparatus as claimed in Claim 2 wherein, the optical transmitter emits radiation in the range 800 to 900 nanometres.
4. (Previously Presented) An apparatus as claimed in Claim 1 wherein each optical transmitter comprises a light emitting diode (LED) providing a source of the diverging beam of incoherent electromagnetic radiation.
5. (Previously Presented) An apparatus as claimed in Claim 4 wherein each optical transmitter comprises the LED and further comprises at least one optical condenser lens, the input to the optical condenser lens being provided by the LED and the output of the optical transmitter being provided by the optical condenser.

6. (Previously Presented) An apparatus as claimed in Claim 1 wherein the diverging beam of incoherent electromagnetic radiation from each transmitter has a beam angle of about 30 to 60 angular minutes.

7. (Cancelled)

8. (Previously Presented) An apparatus as claimed in Claim [6] 1 wherein an input of the optical condenser lens is an input of the optical receiver, and an output of the photodiode is an output of the first optical receiver.

9. (Cancelled)

10. (Previously Presented) An apparatus as claimed in Claim [9] 1 wherein the beam angle is between 30 and 60 angular minutes.

11. (Previously Presented) An apparatus as claimed in Claim 1 wherein the distance between the optical transmitter and optical receiver of a transceiver is greater than or equal to $d/2$, where $d = 30\text{cm}$.

12. (Currently Amended) An apparatus as claimed in Claim 1 wherein an input of the optical transmitter of the first transceiver is connected to an output of a first converter through a modulator, and an output of the optical receiver of the first ~~transceiver~~transceiver is connected to an input of a demodulator, the output thereof being connected to an input of a second converter.

13. (Currently Amended) An apparatus as claimed in Claim 1 wherein an input of the optical transmitter of the second transceiver is connected to an output of a converter through a modulator, and an output of the optical receiver of the second ~~transceiver~~transceiver is connected to an input of a ~~demodulators~~demodulator, the output thereof being connected to the input of a converter.

14. (Previously Presented) An apparatus as claimed in Claim 12 wherein the first and second converters are each made in the form of a transformer, wherein the first converter transforms signals of input discrete information into a coded signal using the Manchester code during transmission, and wherein the second converter is capable of reverse transformation of signals coming from the outputs of the respective demodulators during reception.

15. (Previously Presented) An apparatus as claimed in Claim 1 wherein each optical transceiver further comprises a second optical transmitter and a second optical receiver.

16. (Previously Presented) An apparatus as claimed in Claim 15 wherein each of the first and second transceivers further comprises a summator and a demodulator having an input, and wherein the first and second optical receivers in each optical transceiver are connected to the input of the respective demodulator through the summator.

17. (Previously Presented) An apparatus as claimed in Claim 15 wherein each of the first and second transceivers further comprises a modulator having an output, and wherein the input of the second optical transmitter of each of the transceivers is connected to the output of the respective modulator.

18. (Previously Presented) An apparatus for wireless duplex communication, comprising a first optical transceiver having an optical transmitter and an optical receiver, a second optical transceiver having an optical transmitter and an optical receiver, the first and second optical transceivers being located at opposite ends of an optical communication line, each of the optical transmitters outputting a diverging beam of incoherent electromagnetic radiation and each of the optical receivers including an optical condenser lens, a photodiode, and a diaphragm having an aperture and situated in a focal plane of the optical condenser lens between the optical condenser lens and the photodiode, the distance Δ between the diaphragm and the photodiode being defined by $\Delta = bF/D_c$, where b is the diameter of a light-sensitive site of the photodiode, D_c is the diameter of the optical condenser lens, and F is a focal distance of the optical condenser lens, and a beam angle θ characterizing the transmitters and the receivers being defined by $\tan 2\theta = a/F$ and ranging from about 30 to 60 angular minutes.

19. (Previously Presented) An apparatus as claimed in Claim 18 wherein the optical transmitter and the optical receiver of each of the first and second optical transceivers is separated by a distance greater than or equal to $d/2$, where $d = 30\text{cm}$.

20. (Previously Presented) An apparatus as claimed in Claim 18 wherein each of the first and second optical transceivers further comprises an additional optical transmitter, an additional optical receiver, a modulator, a demodulator, a summator, and first and second converters, wherein the optical transmitter and the additional optical transmitter of each transceiver have their respective inputs connected to an output of the first converter through the

modulator, and the optical receiver and the additional optical receiver of each transceiver have their respective outputs connected to an input of a demodulator through the summator, an output of the demodulator being connected to an input of the second converter.